

REMARKS

Claims 1 - 17 are presently pending. In the above-identified Office Action, the Examiner rejected Claims 1 and 15 under 35 U.S.C. § 112, second paragraph. Claims 1 – 5, 10 and 17 were rejected under 35 U.S.C. § 102(e) as being anticipated by Fisher ('612). While it was not stated explicitly, Claim 16 was implicitly rejected on this basis as well. Claims 6 and 7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Fisher. Claims 8, 9 and 11 - 14 were objected to as being dependent upon a rejected base claim. However, these claims were indicated as being allowable if rewritten in independent form to include the limitations of the base claim and any intervening claims. Claim 15 was allowed.

The indication of allowed and allowable subject is gratefully acknowledged. For the reasons set forth more fully below, Applicants submit that the present Application properly presents Claims patentable over the prior art. Reconsideration, allowance and passage to issue are therefore respectfully requested.

As stated previously, the present invention addresses the need in the art for a system or method for reflecting millimeter-wave frequencies and transmitting optical frequencies without distorting optical frequencies. The need is addressed by the optically transparent dielectric reflector of the present invention. The inventive reflector reflects an incident millimeter-wave beam and transmits optical signals. This behavior is achieved by constructing the reflector from layers of different optically transparent dielectric materials and choosing the thickness and spacing of the individual layers **so that the transmitted waves substantially cancel** in the forward direction, yielding a high degree of transmission loss and a high reflection.

Unlike windows of the prior art, the invention reflects, rather than absorbs, an incident millimeter-wave beam, while transmitting incident optical radiation. Because no liquids are involved, the possibility of leakage is eliminated. Since the incident millimeter-wave energy is reflected rather than absorbed, the possibility of heat-induced damage or failure is greatly reduced. Finally, the quality of the optical images captured

by a camera behind an optically-transparent millimeter-wave reflector is expected to be superior since there are no convection currents present to scatter the incident light.

The invention is set forth in claims of varying scope, of which Claim 1, is illustrative. Claim 1 reads as follows:

1. An apparatus for reflecting an incident millimeter-wave beam comprising:
 - a first layer of dielectric material adapted to receive and partially transmit said incident millimeter-wave beam and
 - one or more additional layers of dielectric materials disposed in alignment with said first layer, each additional layer partially transmitting a wave received through a previous layer and a thickness of each layer being such that waves of said millimeter-wave beam **substantially cancel** in the forward direction. (Emphasis added.)

Clearly, the prior art does not teach, disclose or suggest the invention as presently claimed. That is, the prior art does not teach, disclose or suggest an apparatus for reflecting incident millimeter-wave radiation having plural layers of dielectric material designed so that **waves** of a millimeter-wave beam **substantially cancel** as the beam moves therethrough.

In the Office Action, the Examiner once again relied heavily on Fisher (612). Fisher purports to teach a window that transmits light energy **and selectively absorbs** microwave energy. The Examiner asserts that Fisher teaches an apparatus for reflecting an incident millimeter-wave beam comprising one or more layers of dielectric materials disposed in alignment with a first layer with each additional layer being such that transmitted waves substantially cancel in the forward direction. However, this assertion is not supported by the teachings of the reference. **Moreover, the Examiner has not identified the specific location of any teaching in the reference that supports the Examiner's assertion. That is, where in the reference is there a teaching of a provision of multiple dielectric layers and an alignment thereof effective to achieve a cancellation of transmitted waves in a forward direction ?**

Clearly, Fisher does not teach or suggest an apparatus for reflecting an incident millimeter-wave beam comprising one or more layers of dielectric materials disposed in alignment with a first layer with each additional layer being such that transmitted waves

substantially **cancel** in the forward direction. On the contrary, Fisher merely teaches an absorption or reflection of millimeter-wave radiation using multiple dielectric layers and a conductive grid in a manner consistent with prior teachings. See the Title and Abstract of the reference for examples of the apparent teachings of the reference.

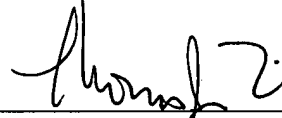
However, as set forth from page 4, line 30 to page 10, line 2 of the Specification, the present invention provides a teaching as to how to construct and space multiple dielectric layers to achieve a cancellation as opposed to an absorption of millimeter-wave radiation. No such teaching is provided by Fisher.

Inasmuch as the claims include limitations directed to the cancellation of millimeter-wave radiation in the forward direction, all of the Claims presently pending should be allowable.

Accordingly, reconsideration, allowance and passage to issue are respectfully requested.

Respectfully submitted,
David D. Crouch *et al.*

By



Thomas J. Finn, Esq.
Attorney for Applicants
Registration No. 48,066

WJB/ns

Raytheon Company
1151 E. Hermans Road
Bldg. 807/F8
Tucson, AZ 85706

520 794-7980
520 794-8171 (fax)